DRAFT

LIBAS. Troy O.U.
38.06.08.03.02

Include USGS report to confirm that the vermiculite present in Troy is morphologically the same as in Libby

How many people work in Libby and live in Troy and therefore would have a possible exposure route to ambient air in Libby? It wasn't clean long ago

Troy TAPS
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DRAFT

TROY ASBESTOS PROPERTY EVALUATION WORK PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN)

FOR THE

TROY ASBESTOS PROPERTY EVALUATION PROJECT

Troy Operable Unit of the Libby Asbestos Superfund Site

1076483 - R8 SDMS

January 2006

Prepared for:

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Remediation Division
P.O. Box 200901
Helena, Montana 59620

Contract Number 402014
Contract Task Order Number 41

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1.0 PROJECT DESCRIPTION AND MANAGEMENT

Does it exist and how much is there? Later this information will be used to support response actions in the Troy area.

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Tetra Tech EM Inc. (Tetra Tech) received Task Order No. 41 from the Montana Department of Environmental Quality, Remediation Division (DEQ/RD), under DEQ Contract No. 402014. The purpose of this task order is to complete a Troy Asbestos Property Evaluation (TAPE) work plan for the Troy Operable Unit (OU) of the Libby Asbestos Superfund Site. We need to say that the Libby site is and EPA led cleanup and why EPA has asked MDEQ to be the lead for Troy. The work plan describes the field and property inspections and sample collection necessary to identify the nature and extent of asbestos-containing vermiculite and the Troy OU property locations that will require remediation I think this is where a problem in this document starts. This work plan really is only to do the first step- identify the extent of contamination at residences and businesses. We aren't describing the nature of this contaminant here either. (that would be in the Libby RI and that is different kind of sampling) If we say "that will require remediation" we are jumping the gun and making this a cleanup work plan. I was struggling with this throughout the document and I think by eliminating this part we will solve some of the confusion in the DQO's.

This work plan document is a combined field sampling plan and quality assurance project plan and is referred to as the TAPE work plan. The TAPE site-specific health and safety plan (HASP) is provided as Appendix A.

Troy, Montana, is located 18 miles northwest of Libby, Montana. From the 1920s until 1990, an active vermiculite mine and associated processing operations was located at Libby. While it was in operation, the vermiculite mine in Libby may have produced 80 percent of the world's supply of vermiculite (EPA 2005). Vermiculite is used primarily for insulation in buildings and as a soil amendment. The vermiculite deposit is contaminated with a form of amphibole asbestos (Libby amphibole [LA]) that is considered a virulent carcinogen. Asbestos is a known carcinogen and is associated with a multitude of respiratory health effects, including asbestosis, lung cancer, and mesothelioma. For decades, vermiculite ore and waste materials were ubiquitous in the Libby community while the mine operated and after its closure.

Some vermiculite mine workers lived in Troy, Montana, and commuted to the mine to work each day. The mine workers were exposed to asbestos-contaminated materials at the mine and processing facilities, and they transported asbestos-contaminated dust to their homes on clothes and equipment. In addition, the asbestos-

contaminated vermiculite ore and waste materials in varying forms may have been used for amending soils (as fill or as a conditioner), as construction fill materials, and for insulating buildings in and around Troy.

In 1999, EPA Region 8 dispatched an emergency response team to investigate in response to media reports that described a high rate of asbestos-related deaths in Libby. Originally believed to be a problem limited to the mine workers, the scope has increased. Subsequent environmental investigations have found many areas in and around Libby contaminated with LA. EPA began Comprehensive Environmental Response Compensation and Liability Act (CERCLA, also known as Superfund) emergency response removal actions in Libby in 2000 that continue today. Properties in Troy are being investigated to evaluate whether sources of LA-contaminated vermiculite exist at these properties.

Deleted: has been transported to these properties and whether the concentrations would pose health risks to the occupants.

Tables and figures in this document follow the first reference in the text. Appendix A contains the site-specific HASP, Appendix B contains copies of project-applicable standard operating procedures (SOPs), Appendix C is a list of equipment and supplies required for the project, Appendix D is an information packet for residents, and Appendix E contains example TAPE project field forms.

1.1 SITE CONCEPTUAL MODEL

Catherine- I would use the current site conceptual model. We will have to revise this with the Libby RI one anyway, so just skip the pain and add it now. You can remove the ambient air pathway, but what about people traveling from Troy to Libby- weren't they exposed to ambient air in Libby? Anyway, it is something to think about. I will email Bill and ask him to send you the most updated SCM. Asbestos exposure is a potential human health concern because chronic inhalation of excessive levels of asbestos fibers suspended in air can result in lung diseases such as asbestosis and mesothelioma. The relationship between asbestos exposure and mesothelioma has been documented, and at least 70 percent of people with mesothelioma report that they have been exposed to asbestos (National Cancer Institute 2005). Figure 1-1 presents a draft Site Conceptual Model for Troy, which identifies exposure pathways by which asbestos fibers from the Libby mine might be inhaled or ingested by humans. The draft site conceptual model will be refined as additional data are acquired and the understanding of actual transport and exposure pathways for Troy is improved. EPA, CDM, and the Montana Department of Public Health and Human Services (Montana DPHHS) have provided additional related background information for the Libby asbestos project and on mesothelioma in Montana (CDM 2003; Montana DPHHS 2005).

1.2 SITE BACKGROUND

Here is where the rationale for the TAPE should be. Why are we investigating Troy? We are investigating Troy because we believe a similar situation to that of Libby exists in Troy. There should be some description of the issues that exist in Libby here. How about this-

Deleted: Properties in Troy are being investigated to evaluate whether LA-contaminated vermiculite has been transported to these properties and at concentrations that would pose health risks to the occupants. ¶

The Troy OU site is located along the Kootenai River valley at an elevation ranging from 1,850 feet above mean sea level (amsl) at the northern end of the OU to 2,500 feet amsl on the mountain slopes surrounding the valley. The Troy OU site is approximately 8 miles long and up to 1.8 miles wide. Topography of the site consists of relatively flat river valley terraces on both sides of a gently graded Kootenai River. Several tributaries flow into the Kootenai River along the 8-mile stretch contained within the Troy OU site. Figure 1-2 provides a topographic view of the Troy OU site along with the boundary of the study area.

As was previously mentioned, Troy is approximately 18 miles from the City of Libby where EPA began Time Critical Removal Actions in 1999. EPA began investigations in Libby through a two phased approach. The Phase I investigation was used to determine in a time critical removal action was warranted in Libby to protect human health, to identify potential major source areas and to identify the appropriate analytical methods for measuring concentrations of LA in those source materials. The Phase II investigation was used to collect detailed information about airborne concentrations in air that result from sources of contamination that are disturbed. The combined results from the Phase I and II investigation include:

- Exposure to Libby amphibole is a threat to human health
- Release of respirable LA fibers occurs when source materials are disturbed
- Source materials include vermiculite insulation, vermiculite products and process wastes, and contaminated soils.
- Contaminated indoor dust found in residential and commercial properties is a potential exposure pathway
- There is widespread presence of LA throughout the Libby area.

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As a result of the findings from the Phase I and II investigations, and because the Libby site was listed on the National Priorities List in 2002, a further investigation of residences and businesses in the Libby study area boundary was warranted. EPA began the Libby Asbestos Site Contaminant Screening Study, which was considered the first part of the Remedial Investigation, in 2002. The goal of the CSS was

(and is) to determine which properties in Libby contained LA source materials. As of December 2005, 4,029 properties were investigated in the Libby area through the CSS. The purpose of the TAPE is identical to that of the CSS. The Troy site conceptual model illustrates that potential exposures in Troy are similar to those in Libby, therefore, a systematic screening of Troy area residences and business is necessary to determine how many Troy area properties will eventually require cleanup.

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TABLE 2-1
(Continued)

KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
10 members	Tetra Tech	Field Team Member	• Responsible for conducting TAPE inspections and sampling as described in the work plan and for following SOPs. • Disseminate project information packets to interested parties and Troy property owners and direct questions to TAPE PM or DEQ/RD	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 (406) 442-5588

Notes:

CDM	Camp Dresser & McKee	DEQ	Montana Dept. of Environmental Quality
EPA	U.S. Environmental Protection Agency	FSP	Field Sampling Plan
QAPP	Quality Assurance Project Plan	SOP	Standard Operating Procedure
TAPE	Troy Asbestos Property Evaluations	Tetra Tech	Tetra Tech EM Inc.
Volpe	John A. Volpe National Transportation Systems Center		
QA/QC	Quality Assurance/Quality Control		

I think we should include some mention of EPA, Volpe and CDM staff here. They are emergency contacts as well and field staff should be aware. However you want to do this is fine with me, but Courtney, Mike, Shawn and the sample coordinator for CDM should be included.

Deleted: ¶

If Tetra Tech obtains soil or dust samples at a property, Tetra Tech will, if requested, provide the property owner with a receipt for the samples identifying the number and types of samples collected before the field crew leaves the property. Sample results may take weeks or months to obtain; therefore, no results will be available during the TAPE inspection and sampling. An individual property owner who requests a split sample must supply all necessary sample bottles, supplies, and materials required for sampling, as well as arrange and pay for laboratory analysis of all split samples collected.

2.3 SPECIAL TRAINING AND CERTIFICATES

Tetra Tech personnel who work on the TAPE project will have met the Occupational Safety and Health Administration (OSHA) training requirements defined in Title 29 Code of Federal Regulations (29 CFR) Part 1910.120(e) for working on hazardous waste sites. These requirements include: (1) 40 hours of formal off-site instruction; (2) a minimum of 3 days of actual on-site field experience under the supervision of a trained and experienced field supervisor; and (3) 8 hours of annual refresher training. In addition, all Tetra Tech personnel working on the TAPE project will have taken the Asbestos Hazard Emergency Response Act (AHERA) 24-hour asbestos inspector training course and will hold a current asbestos inspector license issued by the State of Montana.

3.0 TROY DATA QUALITY OBJECTIVES

This section presents the DQOs for the TAPE inspection and sampling project. The DQOs are qualitative and quantitative statements developed through the seven-step DQO process (EPA 2000a, 2000b). The DQOs help to clarify the study objectives, define the most appropriate data to collect and the conditions under which to collect the data, and specify tolerable limits on decision errors that will be used as the basis for establishing the quantity and quality of data needed to support decision-making. The DQOs are used to develop a scientific and resource-effective design for data collection. The seven steps of the DQO process for this TAPE project are presented in Table 3-1.

Here is where the confusion continues. Maybe you have done this already, and I will write this section if you want, ...

First, there needs to a description of the three sections of a residence need to be here. Discuss attics, soils and interiors.
Within each section describe why you are sampling, or aren't sampling each media. There needs to be a rationale for not sampling attic insulation.
A discussion on what an SUA is and why we sample or don't sample is necessary
Lastly, something on interior dust is necessary.

Background information for the Troy OU study area was discussed in Section 1 as was a draft site conceptual model (Figure 1-1). The Troy properties, where sources of vermiculite contaminated with LA may be found, are not predictable; DEQ has therefore determined that each property in the Troy OU (including privately-owned and publicly-owned property) will be investigated and screened. The properties may or may not contain a building, or multiple buildings; specific use areas (gardens, former gardens, flower beds, and play areas; all are areas with potentially greater exposure or greater use of vermiculite amendments); and yards and open space. Depending on the individual features for each property and building and the concentration of the LA, one or more of the four cleanup alternatives below will be applicable:

I don't think we should discuss cleanup options here- we will likely have to change it with the ROD anyway.

The DQOs will be used to design the TAPE project so that the sampling and analysis provide information about the sources of LA contamination that may or may not exist at each residence.

Deleted: <#>Clean the building attic by removing the vermiculite-containing insulation (VCI)¶
<#>Clean the interior living space¶
<#>Clean the outdoor LA-contaminated soil by removing the LA-contaminated soil¶
Take no further action at this time

Deleted: ¶

Deleted: are

Deleted: appropriate to select the correct alternative for each Troy property.

TABLE 3-1

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY OPERABLE UNIT

STEP 1: State the Problem How can we condense this to not repeat what has already been stated?

Troy, Montana, is located 18 miles from Libby, Montana. Libby is the site of a vermiculite mine and associated processing facilities that operated until 1990 and produced vermiculite insulation and other byproducts. The vermiculite deposit is contaminated with a form of amphibole asbestos (LA). Asbestos is a known and virulent carcinogen and is associated with a multitude of respiratory health effects, including asbestosis, lung cancer, and mesothelioma (DPHHS 2005).

Some mine workers lived in Troy and commuted to the mine to work because Troy is close to Libby. The mine workers were exposed to LA-contaminated materials at the mine and processing facilities, and they may have transported contaminated dust to their homes on clothes and equipment. Vermiculite is used for insulation and soil amendments, and the vermiculite and waste rock (in various forms) were used in construction and for general soil amendments in Troy. VCI and waste materials have been documented in Troy. Properties in Troy should be investigated to evaluate whether LA-contaminated vermiculite has been transported to these sites and at concentrations that would pose health risks to the occupants.

In 1999, in response to media reports EPA Region 8 dispatched an emergency response team to investigate high rates of asbestos-related deaths in Libby. Originally believed to be a problem limited to mine workers, the scope has increased. Subsequent environmental investigations have found many areas in Libby with LA contamination. EPA began Superfund emergency response removal actions in Libby in 2000 that are ongoing. The Montana DEQ is the lead agency for the Troy OU of the Libby Asbestos Superfund site.

The following are problem statements associated with the Troy Properties investigation:

- Exposure to LA-contaminated vermiculite is a threat to human health (EPA 2000c).
- Respirable LA asbestos is released when source materials are disturbed (EPA 2000c).
- Potential source materials include VCI, vermiculite waste products, and soils contaminated with LA.
- Household dust and indoor air are potential exposure pathways.
- LA-contaminated materials may be found randomly in and around Troy.
- All properties within the Troy OU should be evaluated for the presence of LA-contaminated materials.

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY OPERABLE UNIT

STEP 2: Identify the Decisions

Principle Discussion Question: Do sources of LA contamination exist at the property being investigated?

Sampling Decisions: I think the question is what properties do we sample and how do we sample them?

- Identify the number of potential properties to investigate by reviewing aerial photographs, defining individual properties, compiling addresses, and determining if the property could be individually bought or sold.
- Identify the number of buildings on each property within the Troy OU.
- Identify the number of specific use areas, yards, and open space areas on each property in the Troy OU.
- .

STEP 3: Identify Inputs to the Decisions

Figure 3-1 provides a graphic representation of the inputs described in Step 3.

- Inspect the attics of buildings within the Troy OU to visually identify VCI.
- Inspect the living spaces of buildings within the Troy OU to visually confirm migrating VCI.
- Collect dust samples from each building level and analyze them to evaluate whether LA contamination exceeds the cleanup criteria.
- Inspect the outdoor areas of the property (specific use areas, yards, and open space) for visible vermiculite.
- Collect soil samples from each outdoor area and analyze them to determine if LA contamination is present. Figure 3-2 provides plan and cross-sectional views of the typical outdoor sampling that will be performed at each property.

STEP 4: Define Study Boundaries

- The Troy OU generally consists of the valley bottom from the north half of Section 25, Township 31 North, Range 34 West, and Section 30, Township 31 North, Range 33 West, east to the junction of Highways 56 and 2, and north to the northern edge of Section 21, Township 32 North, Range 34 West. Figure 1-2 shows the configuration of the study area for the Troy OU.
- Some properties (approximately 25) within the Troy operable unit have previously been inspected and sampled under the Libby OU4 investigation. Data have been recorded in the Libby database for these properties and will be integrated with additional sampling data from the TAPE.

Deleted: Is a remedial action required at a property to clean up LA contamination?

Deleted: Cleanup Decisions:¶ <#>Identify buildings with open, non-contained, or migrating VCI.¶ <#>Identify the individual levels (floors) within each building with LA in the indoor living space above cleanup criteria (EPA 2003b).¶ <#>Identify the properties with outdoor specific use areas or yards with LA-contaminated soils above cleanup criteria (EPA 2003b). ¶ Identify the properties and buildings where no further action is required at this time.

Deleted: confirm open, non-contained, or migrating

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Deleted: exceeds the cleanup criteria

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 5: Develop Decision Rules How about condensing this into the three section of a residence-
• If VCI is visible in a building attic, then collect dust samples from the living spaces to evaluate whether LA concentrations are present.
• If VCI is not visible in an attic, then collect dust samples from the living spaces to evaluate whether any secondary indoor source of LA has resulted in LA concentrations that exceed cleanup criteria.
• If vermiculite is visible in a building interior, then collect discrete samples to support a small-scale vermiculite removal for the area. In addition, collect dust samples from the other building levels or areas to evaluate whether LA concentrations exceed cleanup criteria in those living spaces.
• If vermiculite is not visible in a building interior, then collect dust samples from the living spaces to evaluate whether secondary indoor source of LA has resulted in LA concentrations that exceed cleanup criteria.
• Collect discrete soil samples from specific use areas to evaluate whether LA concentrations exceed soil cleanup level.
• If the property contains a yard and large open space, then subdivide these areas by similar land uses (for example, grassed areas, driveways, parking areas, and front, back, and side yards) and collect a composite soil sample from each subarea to determine if soils in any subarea contains LA at concentrations that exceed cleanup criteria (EPA 2003).
• Figure 3-1 shows the steps used to inspect and sample buildings and exterior property in the Troy OU. Figure 3-2 provides some typical outdoor soil sampling designs for specific use areas, yards, and open spaces.
STEP 6: Specify Tolerable Limits on Decision Errors
• Sampling and measurement error are associated with environmental data collection and may lead to decision errors. Sampling error occurs when the sample is not representative of the true site conditions. Measurement error occurs because of random and systematic errors associated with sample collection, handling, preparation, analysis, data reduction, and data handling. Decision errors are controlled by adopting a scientific approach that uses hypothesis testing to minimize the potential for error.
• There are two types of decision error: false negative error, and false positive error. A false negative decision error occurs when the null hypothesis is rejected although it is true. The consequences of a false negative error would be that VCI or LA-contaminated dust or soil at a Troy property is not remediated. A false positive decision error occurs when the null hypothesis is not rejected although it is false. The consequences of a false positive error are that unnecessary resources are expended to undertake remedial action to address contaminated media that do not exist at concentrations that exceed action levels or acceptable risk levels.
• Property-specific sampling objectives and the random distribution of vermiculite and LA-contaminant soil limit the usefulness of statistical methods to eliminate sampling error. Therefore, sampling methods and procedures will be based on results from the Libby Asbestos Superfund Site. Tolerable limits on sampling decision errors cannot be precisely defined; however, the decision errors will be minimized by inspecting and screening all properties in the Troy operable unit. Decision errors based on analytical data will be minimized by the use of standard EPA-approved and Libby-specific analytical methods.

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TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 7: Optimize the Sampling Design I like this section!

- All properties in the Troy OU will be uniquely defined in the work plan, and their locations will be identified using existing Lincoln County records, cadastral databases, and low-level aerial photographs. The number of Troy properties to be investigated will be approximately 1,000. Some houses and buildings likely are on multiple platted properties.
- Dust and soil samples will be collected using similar methods and standardized procedures that have been employed for the Libby Asbestos Superfund site. With more than 4,000 Libby properties sampled since 2001, the methods have been defined (CDM 2002; CDM 2003a; CDM 2003b; EPA 2003a).
- Field QA/QC procedures will be implemented and will include equipment decontamination, QA samples, field documentation, and sample chain of custody. Scientifically valid and legally defensible data will be supported by collection of dust and soil field blanks and other QA samples at a frequency necessary to assess potential cross contamination from equipment and sample integrity during collection.

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- Additional building and property details will be collected to support the pre-design inspections when visible triggers are noted during the TAPE inspection. Details may include, but are not limited to:
  - Attics – type of attic; entry locations; vents; barriers in attic; dimensions; and approximate volume of VCI,
  - Living spaces – number and types of rooms and hallways; ceiling conditions; and electrical, mechanical, and plumbing systems,
  - Exterior – site sketches of existing landscape, improvements, and potential additional sample locations,
  - Outside staging areas and electric service.
- Field sample data sheets, similar to those used in Libby, will be completed for each sample collected and each property inspected within the Troy OU. The field data sheet information will be recorded onto electronic records that can be easily added to the existing Libby V2 database.
- Dust and soil samples collected at each Troy property will be uniquely labeled, and sampling information will be recorded onto electronic records. The electronic sample records, along with the samples, will be transferred under chain-of-custody procedures to a CDM sample data coordinator, who will verify completeness and accuracy of the records.
- Montana DEQ and its contractor, Tetra Tech, will work closely with EPA, Volpe, and its contractor, CDM, to ensure that sample integrity is maintained throughout and that data quality is adequate to meet project objectives.
- CDM will transfer the electronic sampling and field form information to EPA and Volpe and prepare the samples for analysis.
- Figure 3-3 provides a schematic diagram of the TAPE process used by Tetra Tech to organize, conduct the property evaluations and sampling, and provide samples and electronic information to CDM, EPA, and Volpe.